

January 12, 2022

Ms. Alesia Cork, CPCU, AIC, LGSW
Zurich North America
1299 Zurich Way
Schaumburg, IL 60196

Re: **Damage Evaluation – Report of Findings**
Project Name: Cole and Christina Francis
Project Address: Lace Ave. Fairfax, MO 64446
Zurich File #: 5630071912
J.S. Held File #: 21101796

Dear Ms. Cork:

At your request, J.S. Held LLC (hereafter, J.S. Held) evaluated reported damage concerning the construction of a single-family residence located at the above-referenced project address. This report conveys the results of the evaluation.

BACKGROUND

The subject residence was a two-story structure (main floor level over a walkout basement level) with a rectangular footprint and covered with a mono-slope roof. The main level floor, walls, and roof structure were conventionally wood-framed, and the basement walls were cast-in-place concrete. The residence was predominately oriented with cardinal directions, with the main level entrance elevation facing north and the walk-out basement elevation facing south. See Figures 1 and 2.

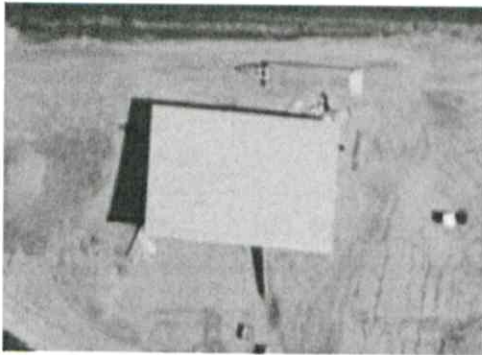


Figure 1 - Aerial view of residence. Top of photo is north, bottom of photo is south.



Figure 2 - View of the west and south elevations.

The residence was partially constructed at the time of this evaluation and was at a “mostly dried in” stage. That is, roofing had been installed, exterior doors and windows were installed, and an exterior water-resistive barrier in the form of synthetic house wrap had been installed over exterior walls. However, no exterior finishes were installed aside from the roof covering, nor were any interior finishes installed. Interior concrete slab-on-grade floors at the main level garage and at the basement had not been placed.

It was understood that the owner of the property had retained a general contractor (GC) to build the residence. Additionally, we understood that construction had begun in May of 2021 and was halted in August of 2021 when the GC abandoned the project. During and/or after the course of construction, the owner of the residence identified several aspects of damage and other issues of concern regarding the in-progress construction.

DEFENDANT'S
EXHIBIT

A

SCOPE OF SERVICES

J.S. Held was retained to evaluate and determine the cause of reported aspects of damage and other issues of concern identified by the owner. The items of concern reported to J.S. Held by the owner were:

1. Incorrect tops of foundation walls at the overhead door openings of the garage.
2. Overhang of the garage walls off the tops of foundation walls.
3. Concrete cracking at the top of foundation wall at the northwest corner of the foundation.
4. Insufficient subgrade preparation depth for the basement floor.
5. Chipped or delaminated areas to the top surfaces of main level subfloor sheathing.
6. Water damage to interior wood floor and wall framing from rainfall prior to the roofing installation.

CONCLUSIONS

J.S. Held concluded the following: (numbered in correlation with the SCOPE OF SERVICE items above)

1. The improper foundation stem wall heights at the overhead garage door openings were the result of deficient construction of the foundation.
2. The overhang of wood-framed garage walls off the foundation was the result of deficient construction of the foundation and/or the prefabricated exterior stud walls.
3. The cracked concrete at the top of foundation wall at the northwest corner of the foundation was reported to have occurred due to impact by construction machinery such as a skid loader during backfilling. J.S. Held could not confirm this as the specific cause of the crack, however the crack damage was consistent with an impact from heavy machinery as described.
4. The insufficient subgrade preparation depth for the basement floor, which would prevent adequate concrete floor slab thickness in some areas, was caused by deficient construction of the site grading and/or insulation placement.
5. The chipped/delaminated areas at fastener locations along the top surfaces of two main level subfloor sheathing panels were caused by deficient or haphazard construction during the installation of the panels.
6. Various areas of the main level exhibited water stains to the top surface of the main subfloor sheathing panels and/or to the bottom edges of sole plates at interior partition walls, which was consistent with exposure to rainwater or other liquids during rough construction. The liquid exposure and stains did not constitute damage and instead are normal and expected conditions of typical residential rough framing prior to dry-in.

REFERENCES

Information obtained from the following sources was utilized in this evaluation:

1. ConnectExplorer by Pictometry, aerial imagery. (<https://explorer.pictometry.com/index.php>)
2. Architectural plans (plan sheets A1 through A8) by Wausau Homes, dated March 20, 2020, titled "Francis Family Dream Home".
3. *LP Legacy Premium Sub-Flooring Installation Instructions*. (LPL0154, 9/21)
4. *8 Common Sub-Floor Installation Mistakes and How to Avoid Them*. (LPL0153, 9/21)

SITE INSPECTION

Christopher Wilkens, P.E. of J.S. Held conducted a site inspection on November 16, 2021. Selected, representative photographs taken during the site inspection are included in **Appendix A** of this report. All photographs and field notes have been retained in the project file.

Also present during the site inspection was the owner, Ms. Christina Francis, who gave access to the property, pointed out the items of concern, and gave general information about the project.

REPORTED INFORMATION

The following information (paraphrased) was verbally reported to J.S. Held from Ms. Christina Francis either during the site inspection or during a previous phone call on November 10, 2021:

1. The tops of concrete walls at the overhead garage door openings were poured without forming keyways for the garage floor, and subsequently had to be jackhammered.
2. The walls of the garage were hanging off the tops of foundation walls.
3. Inside the Living Room area, chunks of OSB had detached from the subfloor.
4. At the corner of the house, a skid loader impacted the foundation and cracked the concrete.
5. The subgrade for the basement floor was not deep enough in places to allow for the full depth of concrete floor slab.
6. The patio door at the walkout basement level had been "ripped out" by exterior grading machinery.
7. Water leaked into the house through the roof framing during a three-month period when the roof deck had been installed but shingles had not yet been installed.
8. The "house was set" on May 11, 2021 and construction stopped in August 2021. Issues were found starting in July 2021.
9. Wood exterior wall framing was prefabricated and had been trucked in.
10. Exterior siding was to be vinyl siding.

SITE OBSERVATIONS and ANALYSIS**Item 1: Incorrect tops of foundation walls at the overhead door openings of the garage.**

The top surfaces of the foundation stem walls at the garage door openings were observed to have rough surfaces characterized by jagged and loose chunks of concrete. Additionally, pieces of broken concrete were strewn along the ground adjacent to the stem walls. (Appendix A, Photos 1-3)

Typical layout and construction of concrete garage floors entails the concrete floor slab to overtop the foundation stem walls at exterior door openings. In this manner, the finished concrete floor surface is continuous through the door opening to the interface with exterior elements. Conversely, foundation stem walls surrounding a garage that underlie exterior walls are, at minimum, level to the top of the garage floor and oftentimes above the surface of the garage floor. Therefore, the top of foundation wall must be constructed at a lower elevation in the areas of door openings, as compared to the remainder of the wall elevations.

The strewn concrete remnants and rough surfaces to the top of walls within the overhead door openings were consistent with the wall having been constructed too high, and subsequently having been lowered via jackhammering as reported by the owner. This scenario was an as-constructed issue, and therefore J.S. Held concluded that:

The improper foundation stem wall heights at the overhead garage door openings were the result of deficient construction of the foundation.

Item 2: Overhang of the garage walls off the tops of foundation walls.

At the east elevation of the garage, the outside faces of the wood framed exterior wall, 2x6 sill plates overhung past the outside faces of the concrete stem walls. The amount of overhang increased from the northeast corner to the southeast corner of the garage, with the maximum amount at the southeast corner being approximately a 2.25-inch overhang. (Appendix A, Photos 4-7)

Typical residential construction layout entails alignment of the outside face of exterior wall studs to vertically align with the outside face of concrete stem walls. Review of the architectural plan details, particularly Section E-E on Sheet A4, confirmed that such alignment was the design intent on this project. The misalignments and overhangs of the east garage wall therefore represented inaccurate, as-built construction that did not assure proper alignment.

This project utilized prefabricated exterior wall segments, as reported by the owner. In such construction, the walls are prefabricated to exacting dimensions as specified during ordering, and/or as dimensioned on construction plans. Therefore, the site-built foundation components must be constructed to exacting dimensions in order to achieve proper alignment with the prefabricated walls. This is in contrast to site-built exterior wood walls, which can be adjusted as needed to accommodate inaccuracies of foundation wall construction. The misalignments were therefore an indication that either 1) the foundation walls were inaccurately constructed from their intended layout, or 2) the prefabricated walls were either improperly coordinated (e.g., ordered with inaccurate dimensions) or were inaccurately fabricated. In any case, or a combination of cases, the scenario was an as-constructed issue, and therefore J.S. Held concluded that:

The misalignments and excessive overhang of wood-framed garage walls off the foundation was the result of deficient construction of the foundation and/or the prefabricated exterior stud walls.

Item 3: Cracked concrete at the top of foundation wall at the northwest corner of the foundation.

At the northwest corner of the foundation, a concrete crack wrapped around the corner, located approximately 4 inches below the top of the wall. The crack extended diagonally upward along each of the north and west foundation walls, approximately 8 to 10 inches in each direction before terminating at the top of walls. A relatively small piece of concrete (approximately 1/2 inch in depth) had spalled off the north wall along the crack location. Additionally, another concrete spall was located approximately 6 to 8 inches below the corner crack; The spall was about 4 inches tall by 2 inches deep and had spalled off the exterior corner of the wall. No cracks were visible to the inside face of concrete at this area. (Appendix A, Photos 8-13)

The owner reported that a skid steer had impacted the foundation wall, causing the crack and spall damage, during foundation backfilling or other movements nearby the northwest corner of the residence. Although this exact reported event could not be confirmed, the observed crack and spall damage, and the localized nature thereof, was consistent with the type of concrete damage that would result from such as impact by a sufficiently hardened and heavy object. Therefore J.S. Held concluded that:

The cracked concrete at the top of foundation wall at the northwest corner of the foundation was reported to have occurred due to impact by construction machinery such as a skid loader during backfilling. J.S. Held could not confirm this as the specific cause of the crack, however the crack damage was consistent with an impact from heavy machinery as described.

Item 4: Insufficient subgrade preparation depth for the basement floor.

At the interior basement floor area, rigid insulation was in place atop the earthen subgrade, along with welded wire fabric, steel rebar, and radiant heat tubing above the rigid insulation in preparation for placement of the concrete floor slab-on-grade. Along the south elevation of the basement, the top surface of the rigid insulation varied in depth. It was measured to be 5 inches below the top of the foundation wall at the west end of the wall, and 3 inches below the top of foundation wall at the east end of the wall. (Appendix A, Photos 14-15)

Review of the architectural plans, specifically Section D-D of Sheet A4, revealed that the basement floor was to be a concrete slab-on-grade floor constructed over rigid insulation, and with the top of concrete floor slab elevation to be aligned with the top of the south foundation stem wall. Based on the measurements taken along the south wall, the as-prepared rigid insulation surface would lead to a 5-inch slab thickness at the western end of the wall and a 3-inch slab thickness at the eastern end of the wall. Therefore, the rigid insulation had not been accurately set to allow for a 4-inch concrete floor slab thickness. The top elevation of the rigid insulation would have been a function of both the prepared surface elevation of the earthen subgrade below, and the thickness of the insulation. As such, one or both components had necessarily been inaccurately constructed. Therefore, J.S. Held concluded that:

The insufficient subgrade preparation depth for the basement floor, which would prevent adequate concrete floor slab thickness in some areas, was caused by deficient construction of the site grading and/or insulation placement.

Item 5: Spalled areas to the top surfaces of main level subfloor sheathing.

At the main level, interior floor in the Living Room, two adjacent oriented strand board (OSB) subfloor panels exhibited spalled areas of the OSB. The spalls were relatively small in size (approximately 2 inches or less in width or length), and were coincident with nail locations along the ends of the panels. In addition to spalls, there were some instances of upward-delaminated OSB material surrounding nail locations. Several adjacent panels had been installed with alignment of panel ends atop one single floor joist. Several nails fastening the OSB to the floor joist along the end joints had driven through the underside of the floor joist flange, making the nail shanks visible, and two different types of nails were present: rink shank and smooth shank. (Appendix A, Photos 16-24)

The physical damage to the OSB surrounding the nail fasteners was consistent with either a concentrated downward impact and/or a concentrated internal upward force from embedded nail heads. Concentrated downward impacts could come from a hammer strike when manually hammering nails into the wood, or, from a pneumatic nail gun overdriving a nail into the wood due to over-pressurization. Conversely, an upward internal force from an embedded nail head can occur when nails are underdriven, leaving a gap between the attached pieces of wood, followed by a subsequent closing of the gap. Lastly, there is the potential that the panels had been previously fastened and then detached (e.g., a re-use or repositioning of the panels). Any of these cases would constitute haphazard workmanship. Other evidence of haphazard workmanship was present, such as a continued end alignment of adjacent panels which is a commonly known condition to avoid and is specifically addressed in published installation instructions for the product. Additionally, the presence of both rink shank and smooth shank nails suggested differing times of nailing application, and with potentially different means such as manual versus pneumatic. This was an indication of an attempt to tighten the connection with secondary nailing or bolster the connections due to existing damaged nailing. Therefore, J.S. Held concluded that:

The spall areas at fastener locations along the top surfaces of two main level subfloor sheathing panels were caused by deficient or haphazard construction during the installation of the panels.

Item 6: Water damage to interior wood floor and wall framing from rainfall prior to the roofing installation.

In some locations of the main level interior floor, such as around the Bath 2 area (as labeled on Sheet A5 of the architectural plans), the top surface of the OSB exhibited a dark stain coloration consistent with being wetted by water or other liquid. In some instances, dark discoloration was visible to the bottom edges of interior partition wall baseplates where in contact with the OSB. No physical damage was noted at these locations other than superficial discoloration. Separately, isolated instances of delaminated "bubbles" were visible on the surface of the OSB, where the top lam of the OSB had delaminated and raised upward. These delaminated areas were less than 4 inches in length and 1 inch in width and did not coincide with discoloration stains on the floor surface. (Appendix A, Photos 25-29)

The owner had reported rainwater entering into the house through the rough roof framing, prior to the installation of the shingle roof covering, for approximately three months. Wetting of rough framing is commonplace during rough construction, and isolated wettings do not cause damage to wood framing components when subsequent drying occurs within a reasonable amount of time. This was reinforced in the published literature by the OSB manufacturer which stated, "*Exposure to reasonable precipitation during normal construction delays will not damage the panels.*" As such, the mere presence of water onto the OSB panels, and subsequent discoloration staining thereof, does not constitute damage.

Conversely, OSB can begin to delaminate if held in wetted conditions for prolonged periods of time. The isolated instances of delaminated OSB were without coincident water stains, which indicated a lack of prolonged wetted conditions to those areas. That, coupled with the relatively small and discrete sizes of the delamination made them consistent with anomalies inherent to the OSB product rather than incurred damage.

Therefore, J.S. Held concluded that:

Various areas of the main level exhibited water stains to the top surface of the main subfloor sheathing panels and/or to the bottom edges of sole plates at interior partition walls, which was consistent with exposure to rainwater or other liquids during rough construction. The liquid exposure and stains did not constitute damage and instead are normal and expected conditions of typical residential rough framing prior to dry-in.

CLOSING

Thank you for the opportunity to provide professional services. The opinions and conclusions in this report have been formulated within a reasonable degree of professional certainty. Please note that J.S. Held opinions are based on the information provided and/or obtained as well as our training, knowledge, and experience. To the extent that hidden conditions exist, and/or additional information is made available, J.S. Held reserves the right to revise or update any of the observations, assessments, and/or opinions as conditions change or additional information is provided for our review.

This document is to inure to the benefit of the addressee only and may not be relied upon, used by, or referenced by any third party without the written consent of J.S. Held. If clarification or additional information is required, please do not hesitate to contact us.

Respectfully,
J.S. Held LLC



This item has been electronically signed and sealed by Christopher Wilkens, P.E. on January 12, 2022 using a Digital Signature. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.

Christopher Wilkens, P.E.
Vice President – Senior Engineer
Missouri PE # 2011026226 (expires 12/31/2023)

Appendix A: Photographs
Appendix B: Architectural Plans



APPENDIX A

Photographs

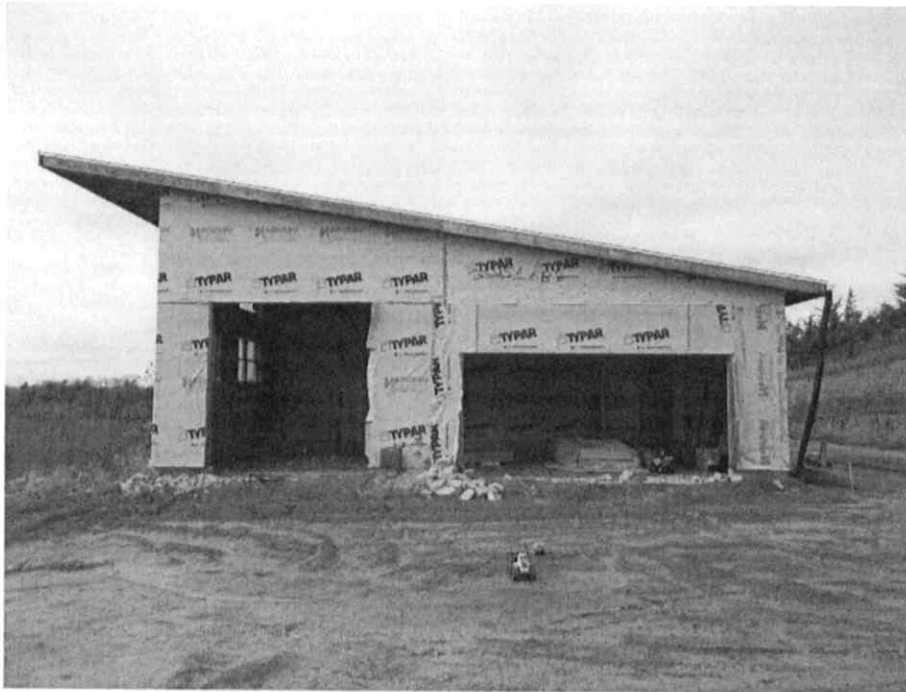


Photo 1: View of the east elevation showing the overhead garage door openings.



Photo 2: View of remnant concrete chunks along the foundation stem walls at garage openings.



Photo 3: View looking downward at the top surface of the foundation stem wall at overhead garage door openings, showing jagged and loose concrete.

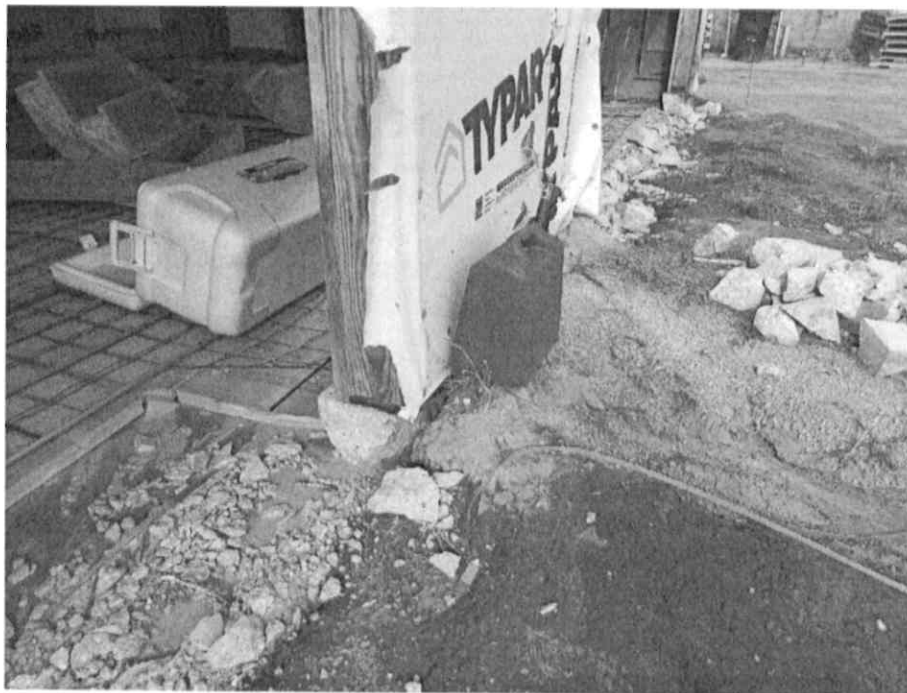


Photo 4: View of the exterior wall at east elevation of garage between the overhead doors. See also next photo.



Photo 5: View of approximate 1 inch overhang of east exterior wall sill plate (red arrow) off the outside face of concrete foundation wall.



Photo 6: View of the exterior wall at east elevation of garage at the southeast corner of the garage. See also next photo.

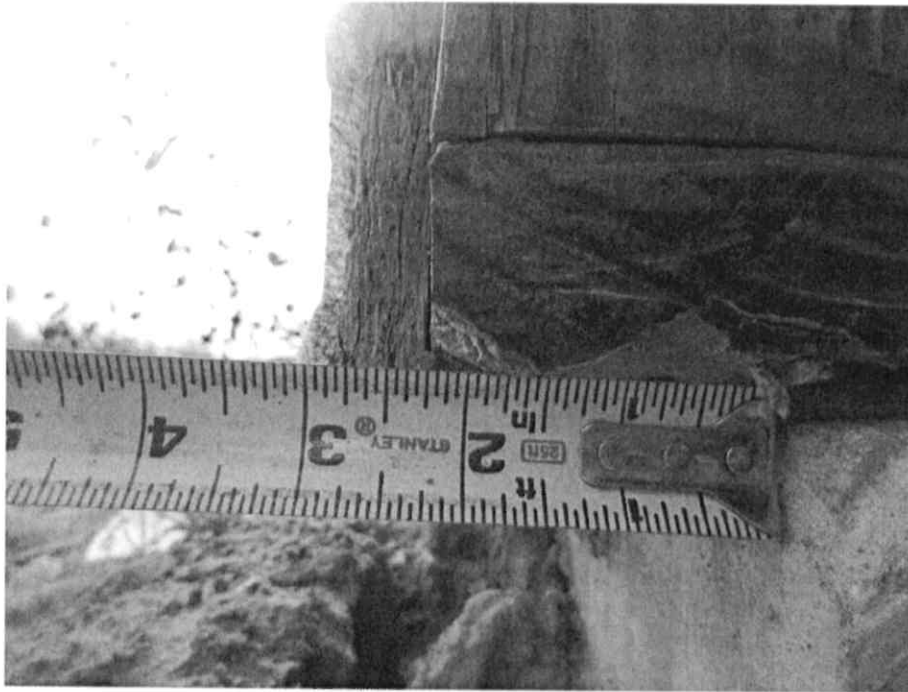


Photo 7: View of approximate 2.25 inch overhang of east exterior wall sill plate off the outside face of concrete foundation wall.

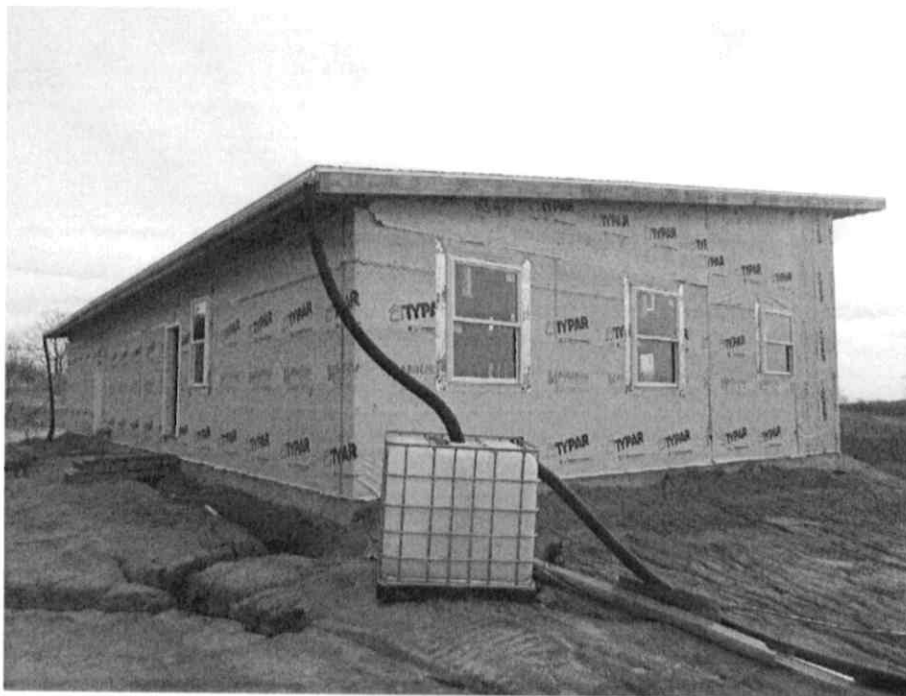


Photo 8: View of the west and north elevations of the residence showing the northwest corner of the residence in the foreground.



Photo 9: View of the northwest corner of the foundation showing a concrete crack and the top of corner and spalled concrete below the crack. See also next photos.

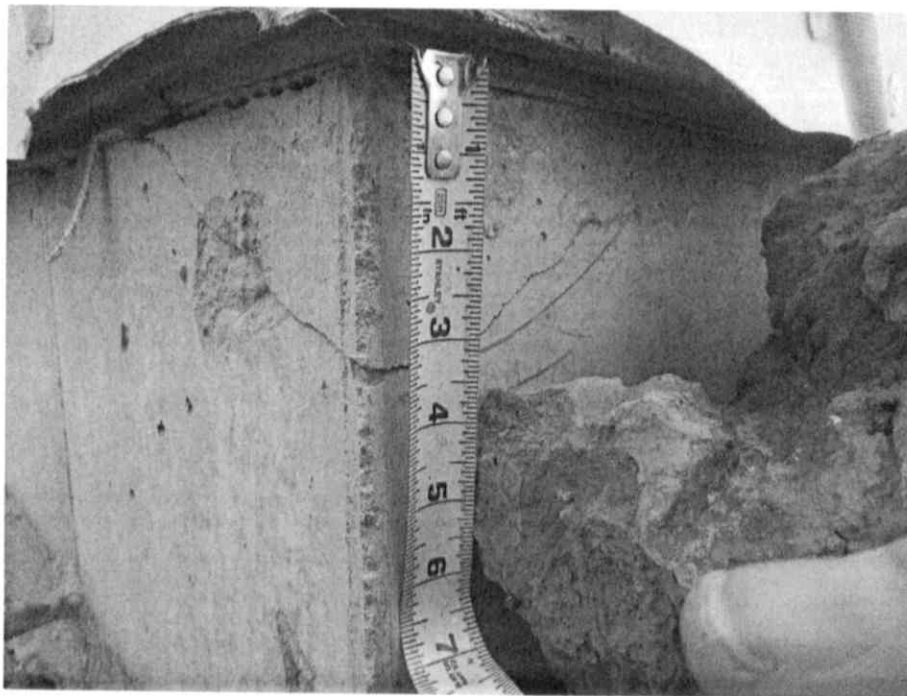


Photo 10: View of the northwest corner concrete crack at the top 4 inches of foundation wall height, extended upward along the north and west foundation walls approximately 8 to 10 inches in each direction before reaching the top of walls.



Photo 11: View of spalled concrete off corner of foundation below the concrete crack area.

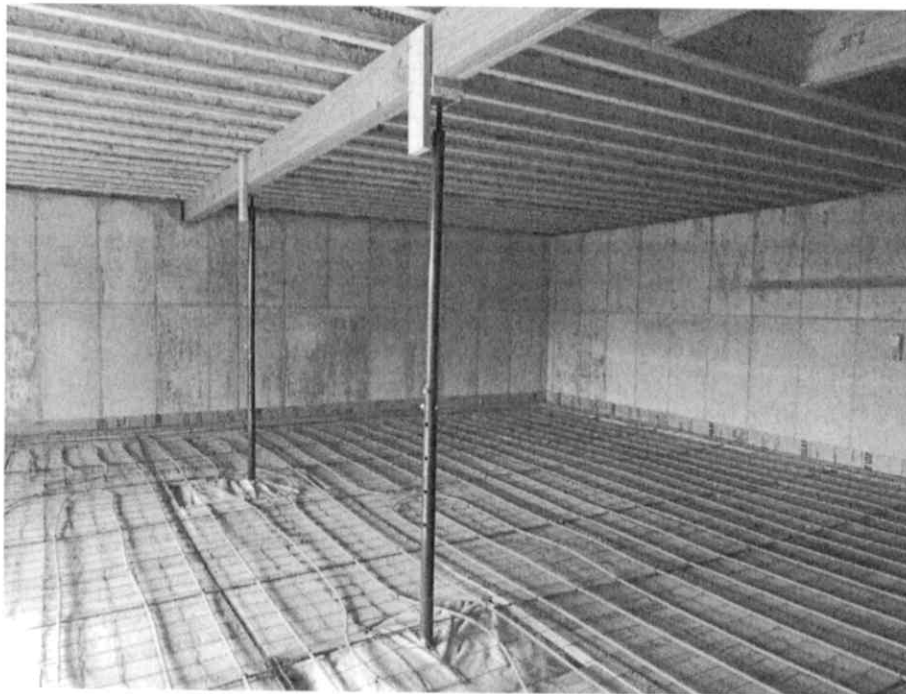


Photo 12: View within the basement looking northwest toward the northwest foundation wall corner.

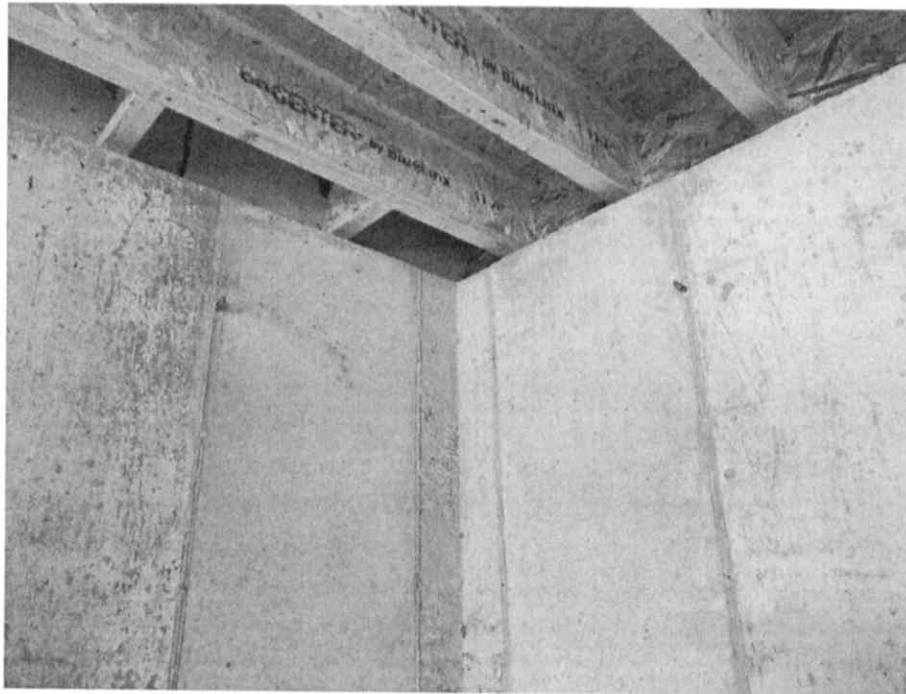


Photo 13: View of the top portion of the foundation wall at the northwest corner showing an absence of visible cracks.



Photo 14: View of a basement floor location where the top surface of rigid insulation on the ground was 5 inches below the top of exterior foundation wall.

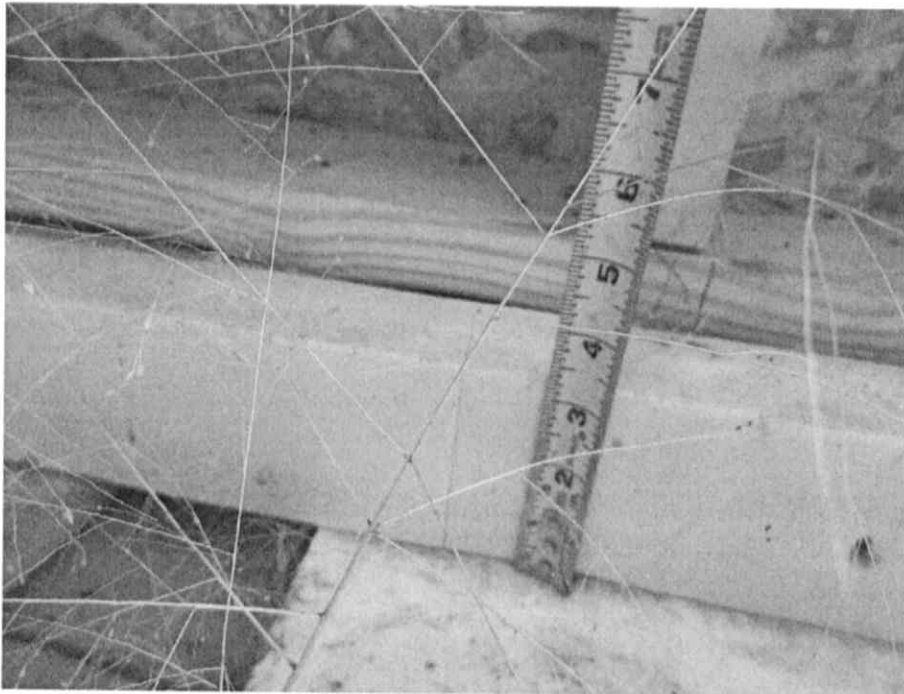


Photo 15: View of a basement floor location where the top surface of rigid insulation on the ground was 3 inches below the top of exterior foundation wall.

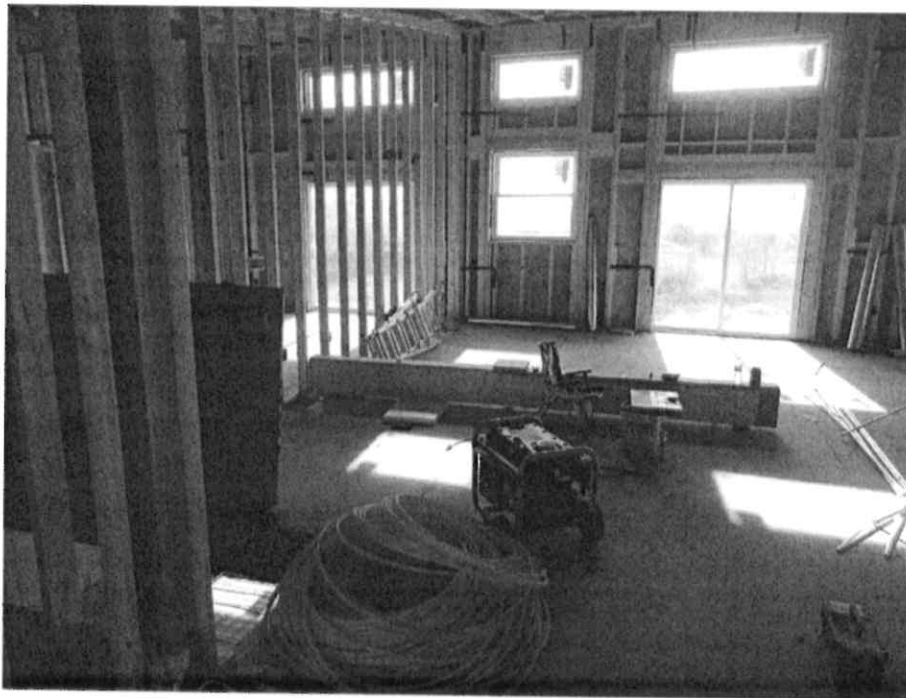


Photo 16: View of the main level, interior floor space looking south into the Living Room area.

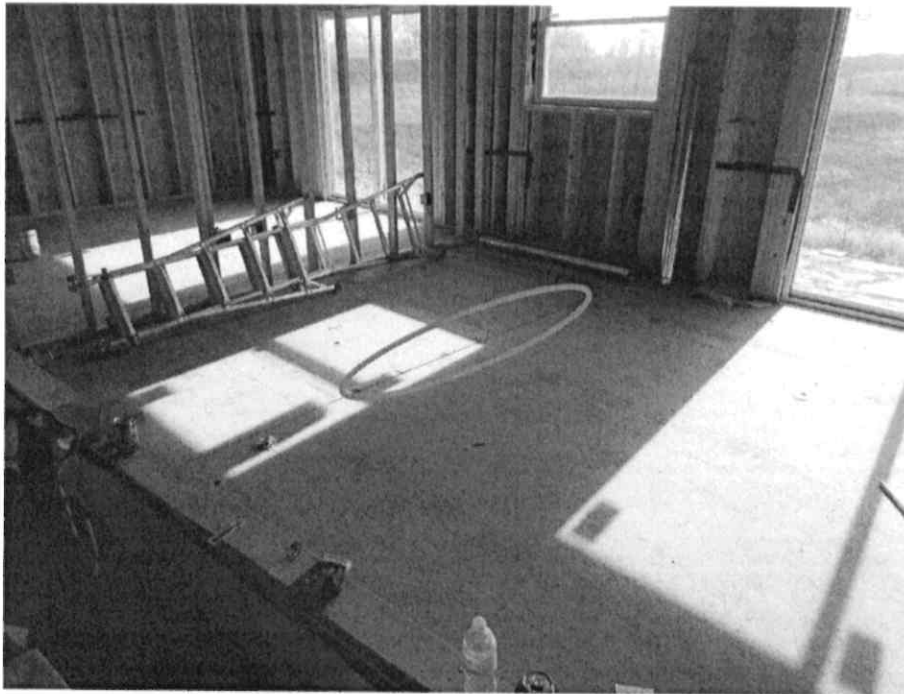


Photo 17: View of the Living Room area, with red oval added to identify the locations of spalls within the OSB subfloor.

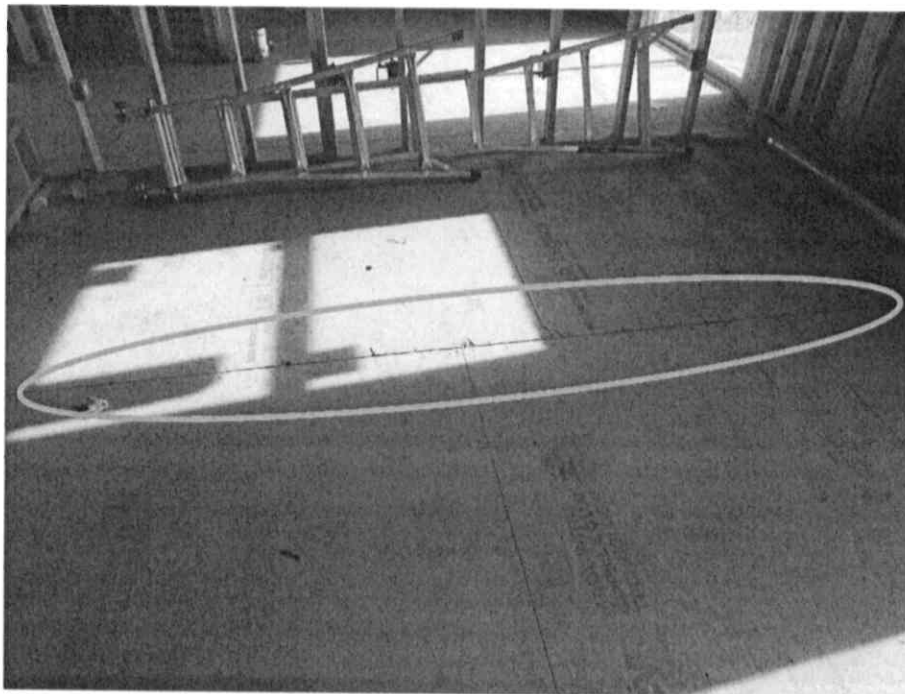


Photo 18: View of Living Room area with OSB spalls. Note the aligned butt joint location of several adjacent panels (blue oval).

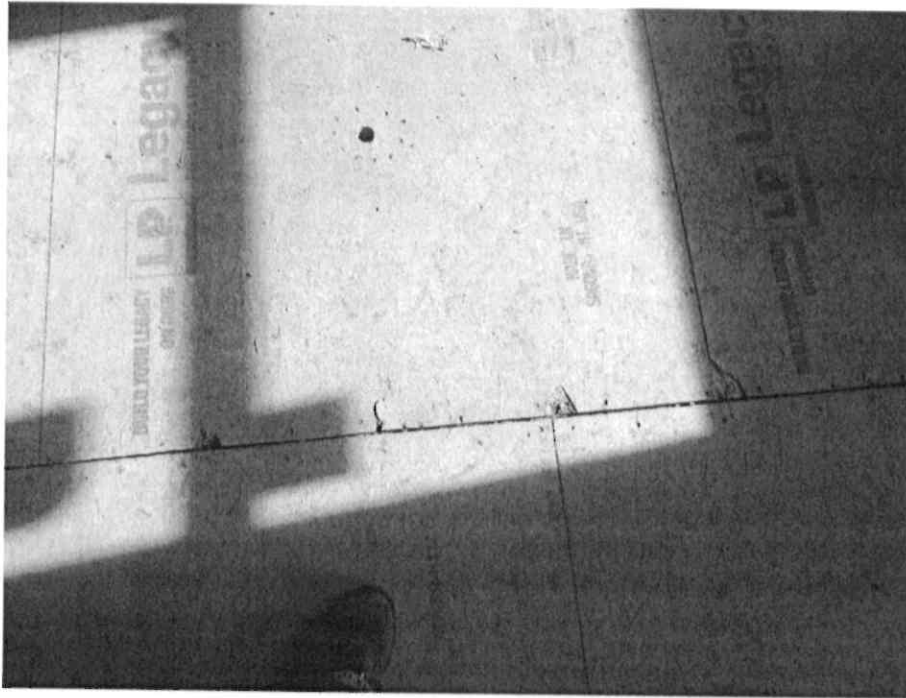


Photo 19: View of the OSB spalls within the Living Room area.

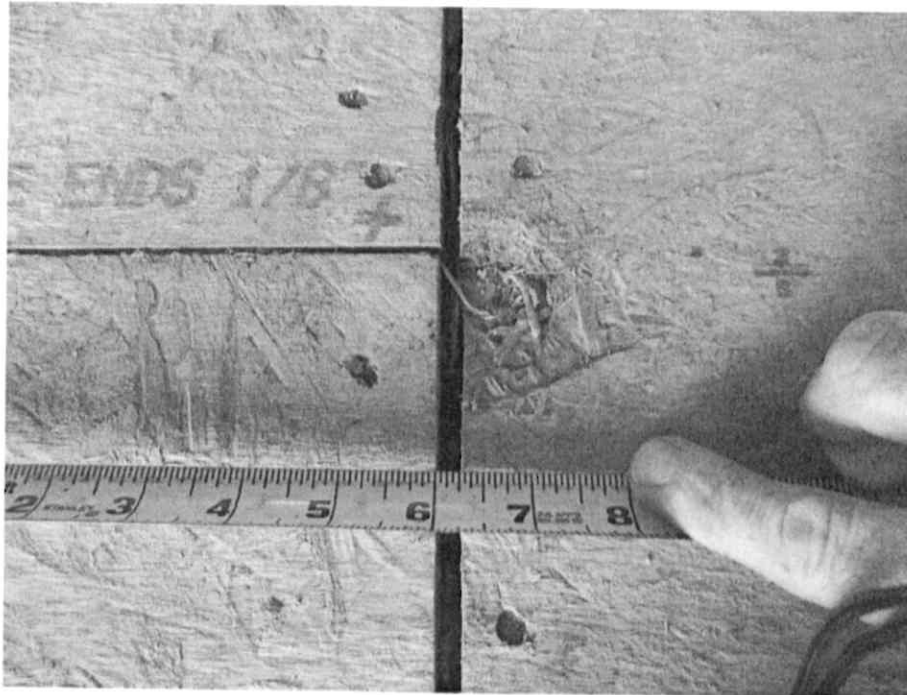


Photo 20: View of a typical spall in the OSB subfloor.

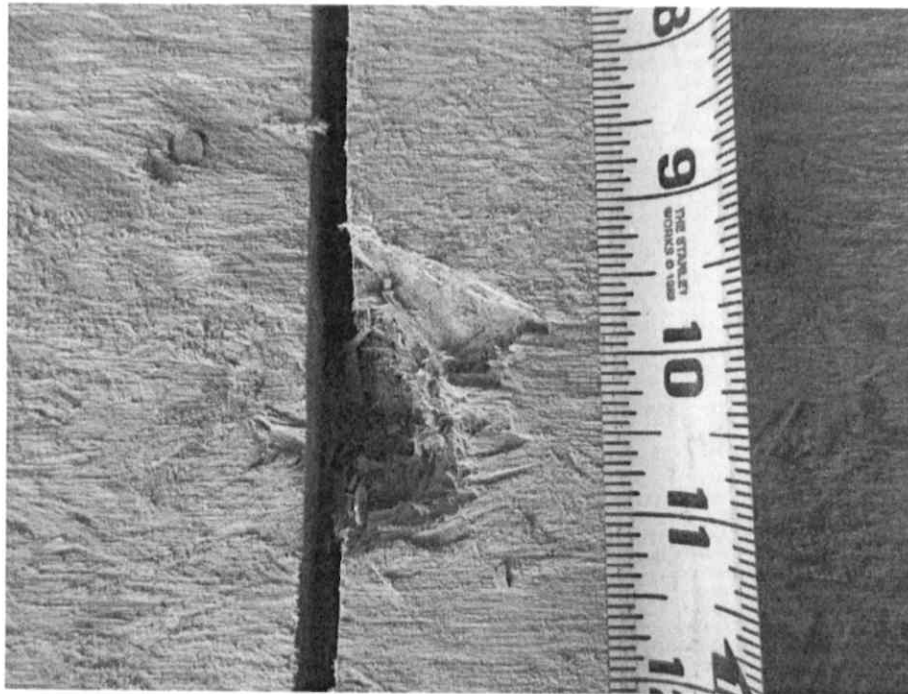


Photo 21: View of a typical spall in the OSB subfloor.

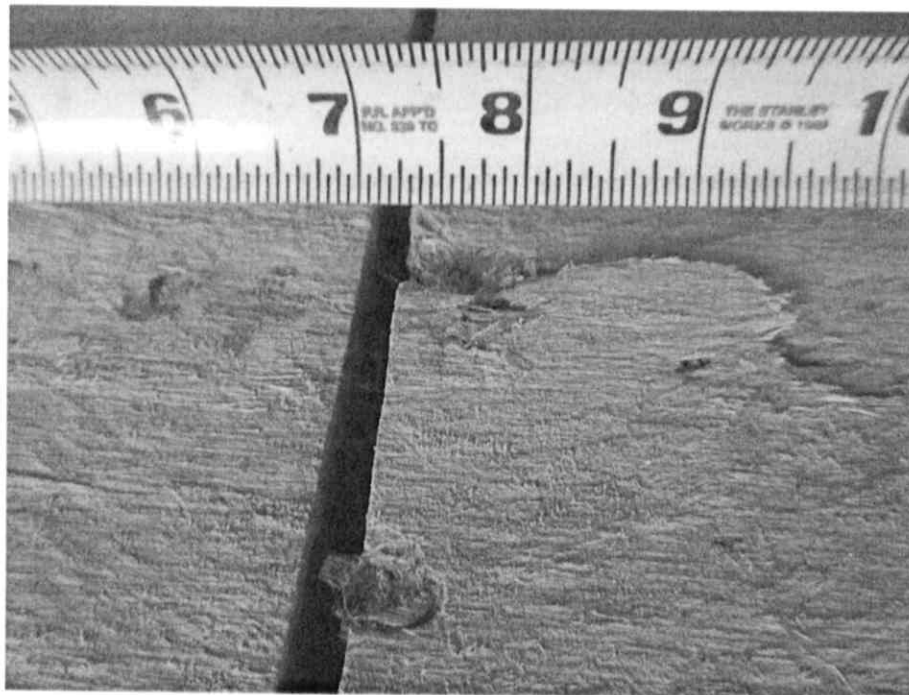


Photo 22: View of an upward delaminated surface of the OSB.



Photo 23: View of underside of panel with OSB spalls.



Photo 24: View of underside of spalled OSB panel showing a ring shank nail (red arrow) and a smooth shank nail (blue arrow) fastening the OSB to the top of the floor joist.



Photo 25: View of the Bath 2 area of the main level floor, showing water stains to the surface of the OSB subfloor.



Photo 26: Closer view of water stains to the OSB subfloor.

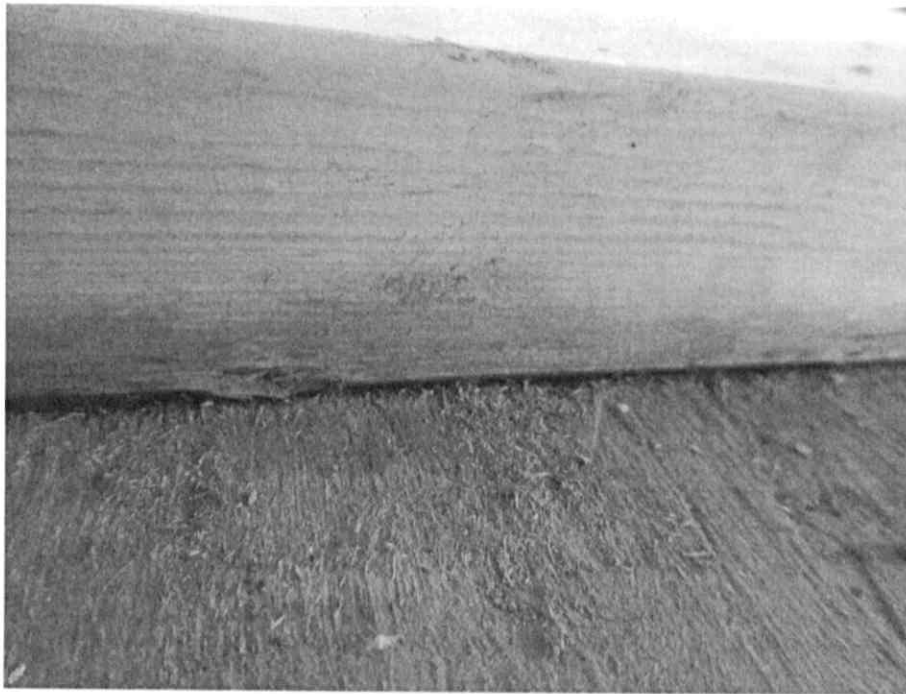


Photo 27: View of water stains at the bottom edge of a wood plate at interior partition wall.

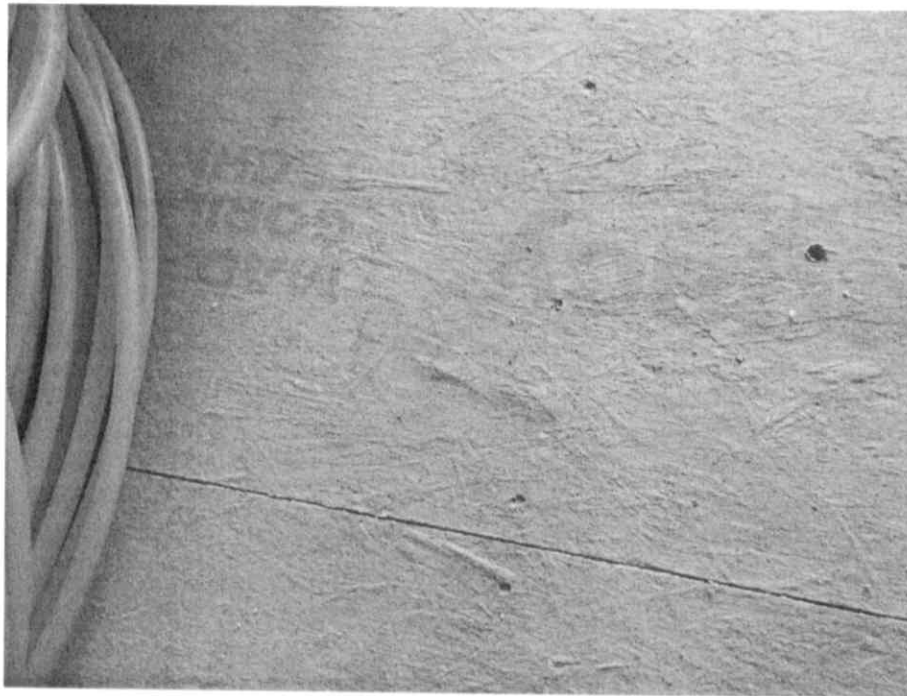


Photo 28: View of isolated area with delamination of top OSB ply. See also next photo.

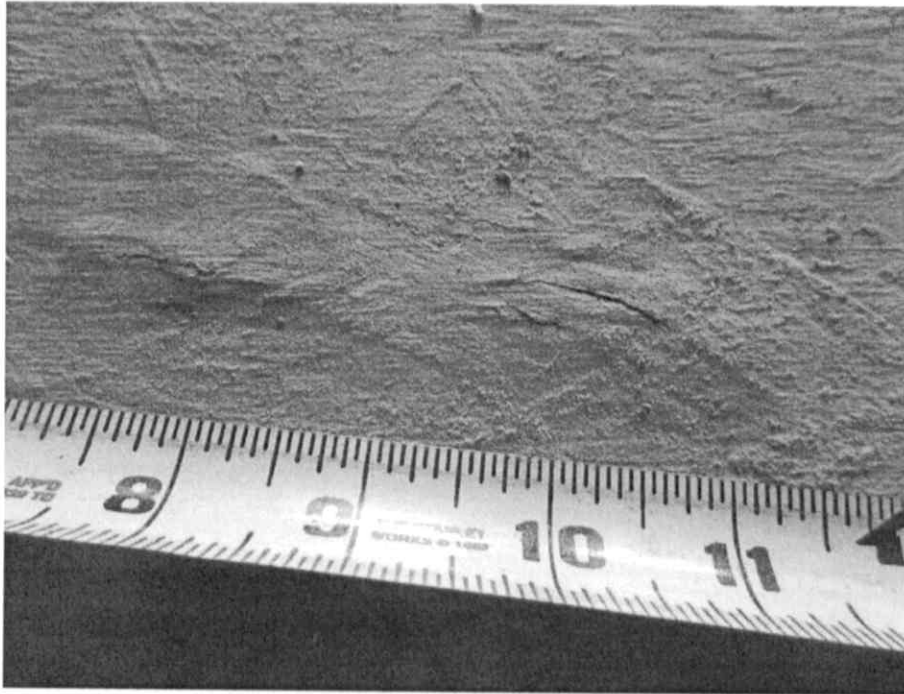


Photo 29: View of isolated area with delamination of top OSB ply.

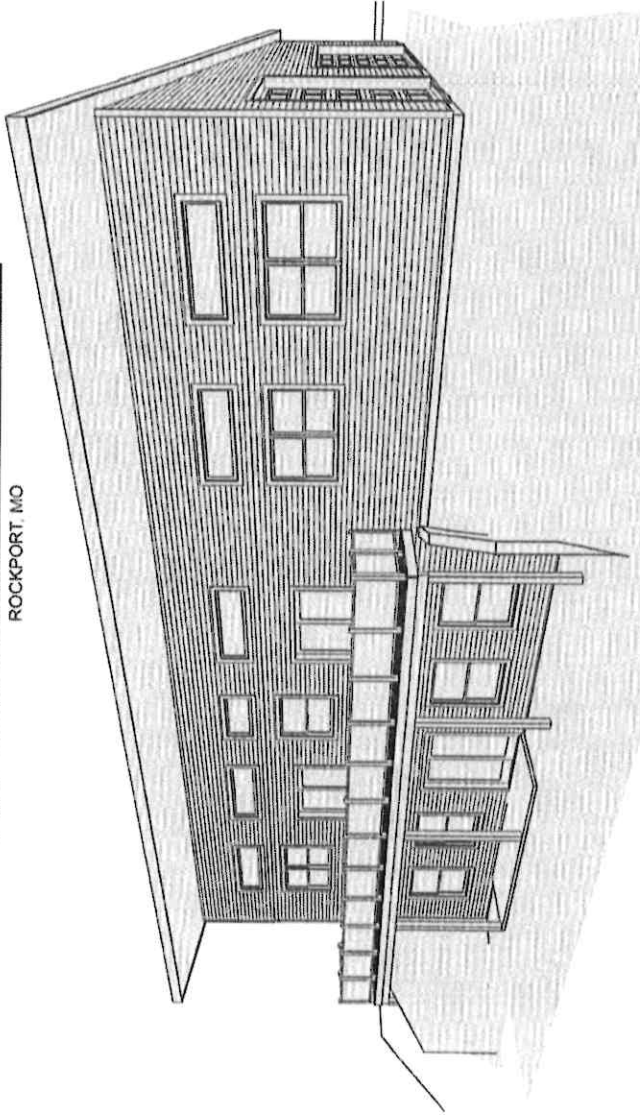


APPENDIX B

Architectural Plans

FRANCIS FAMILY DREAM HOME

ROCKPORT, MO



GENERAL NOTES:

1. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXISTING UTILITIES AND STRUCTURES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THEM.
2. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXISTING UTILITIES AND STRUCTURES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THEM.
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10. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXISTING UTILITIES AND STRUCTURES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THEM.

DIMENSIONS:

1. ALL DIMENSIONS TO BE SHOWN ON THIS PLAN SHALL BE IN FEET AND INCHES.
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4. ALL DIMENSIONS TO BE SHOWN ON THIS PLAN SHALL BE IN FEET AND INCHES.

ABBREVIATIONS:

- CONC CONCRETE
- EXT EXTERIOR
- FLR FLOOR
- FOUND FOUNDATION
- FTS FOOTING
- GR GRASS
- SPRCE SPRUCE
- TRYP TRYP
- WTR WATER

DETAILS:

1. DETAILS SHOWN ON THIS PLAN SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL RESIDENTIAL CODE BOOK.
2. DETAILS SHOWN ON THIS PLAN SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL RESIDENTIAL CODE BOOK.
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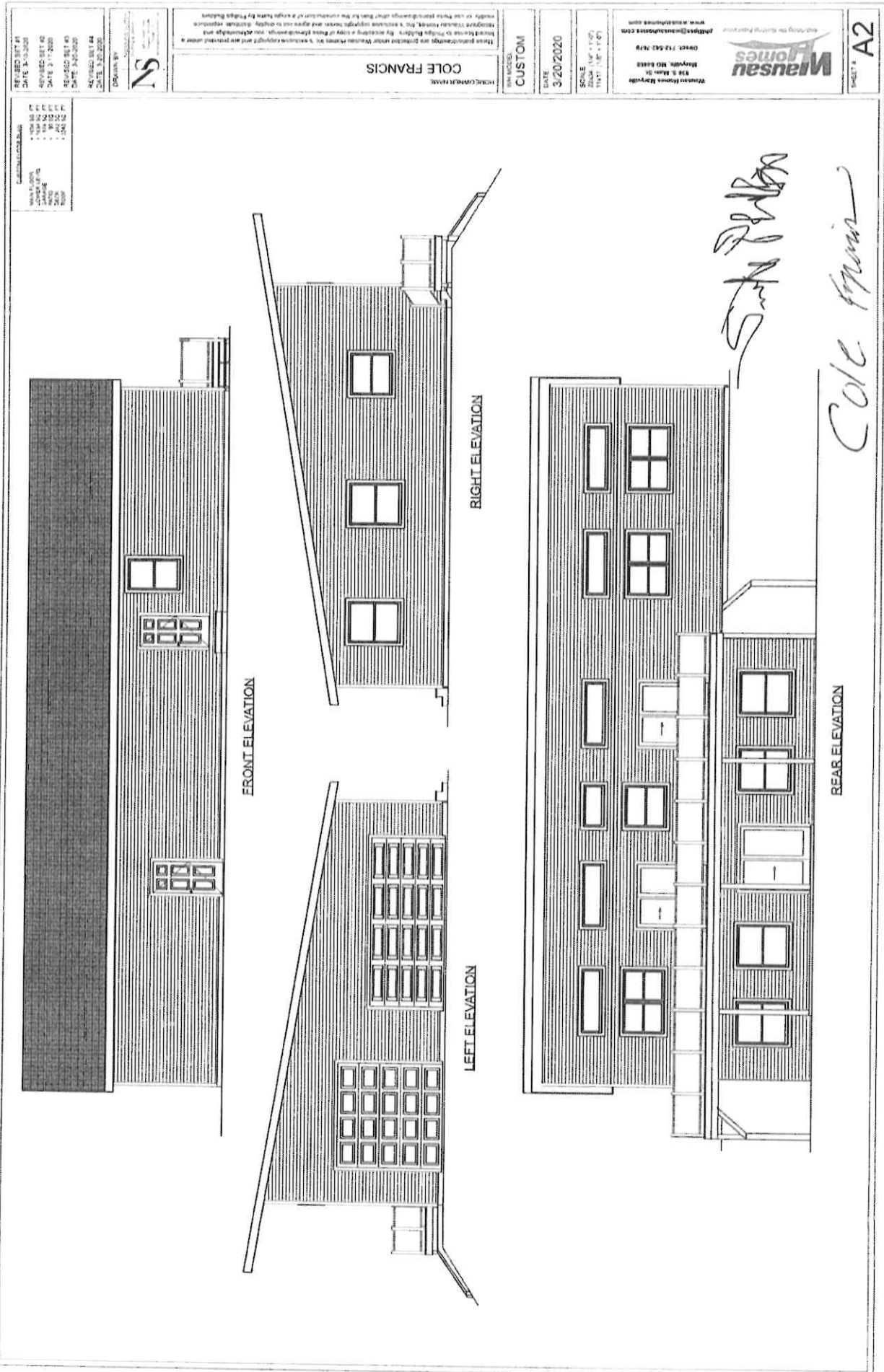
DESIGNED BY: JF
 DATE: 3/15/2020
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 DATE: 3/15/2020

SCALE: 1/4" = 1'-0"

COLE FRANCIS
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 FAX: (314) 433-1235
 EMAIL: info@mausauhomes.com
 WWW.MAUSAUHOMES.COM

SHEET # A1



REVISION SET AT
DATE 3-20-2020
REVISED SET #2
DATE 3-21-2020
REVISED SET #3
DATE 3-22-2020
REVISED SET #4
DATE 3-23-2020

COLE FRANCIS
3/20/2020

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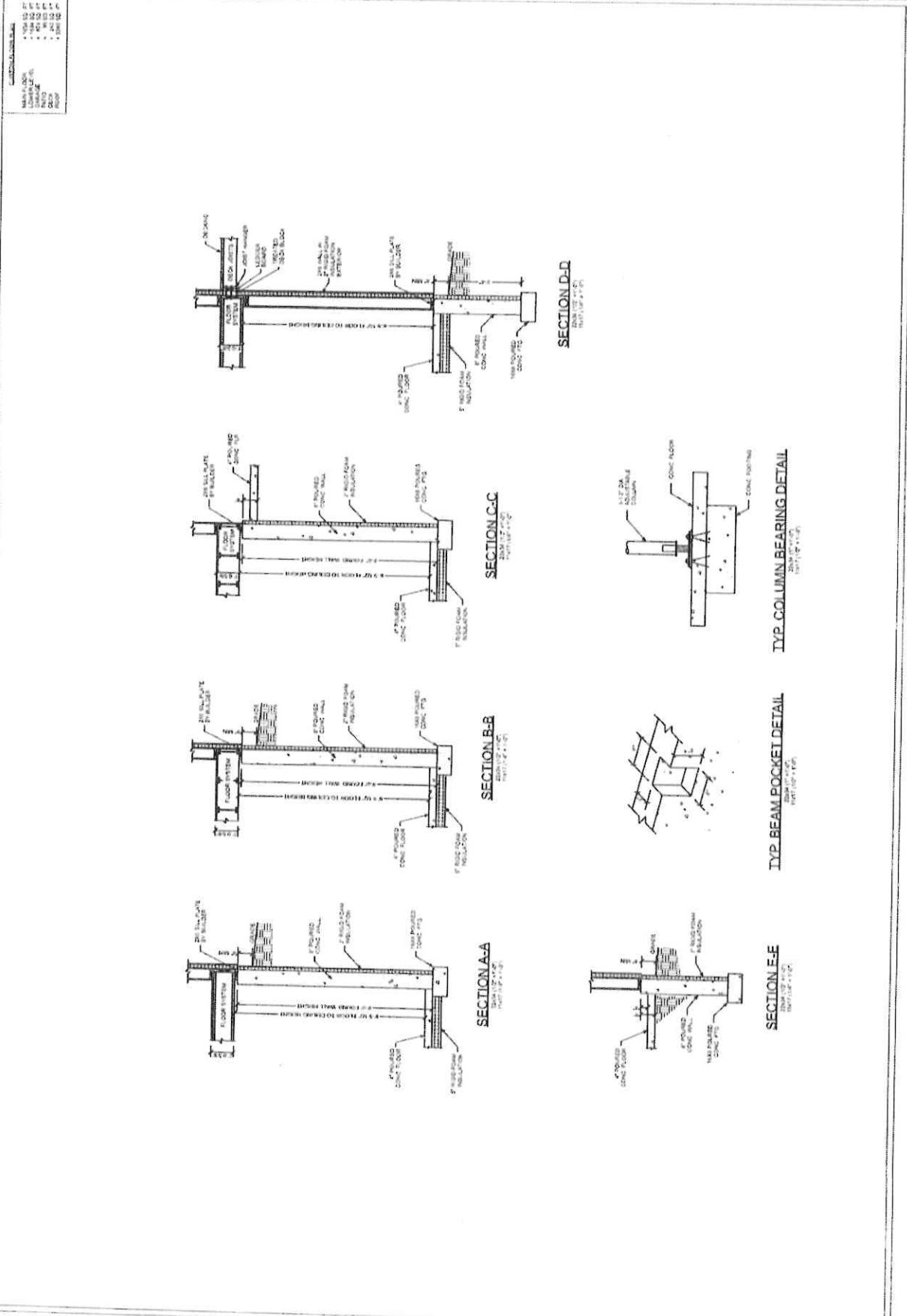
DATE
3/20/2020

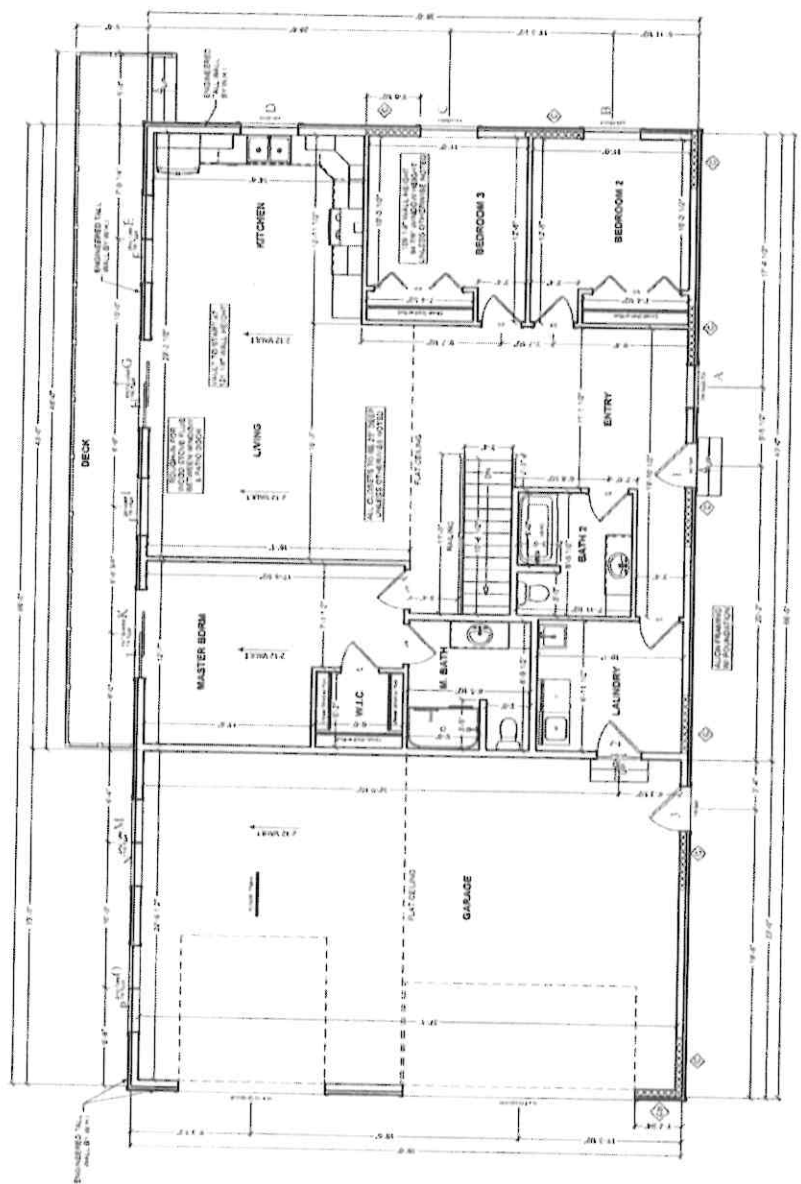
SCALE
1/4" = 1'-0"

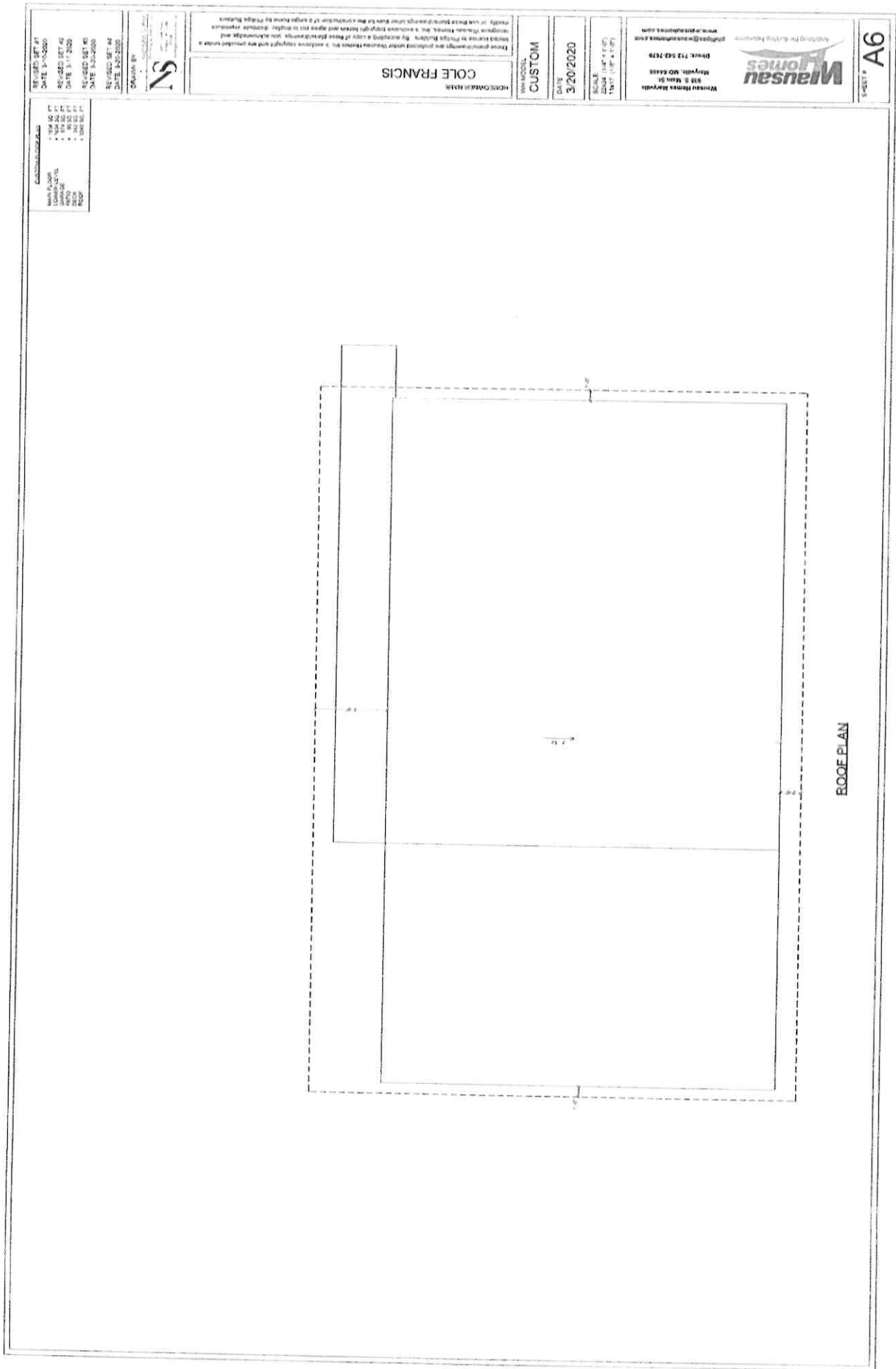
Mosaic Homes, Maryland
800 N. Main St.
Baltimore, MD 21201
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SHEET # A2





[illegible]



ROOF PLAN

SHEET # A6



Website: www.mausuhomes.com
 Email: info@mausuhomes.com
 Phone: 772.542.7579
 300 S. Main St.
 Ft. Pierce, FL 34946

DATE: 3/20/2020
 SCALE: 1/8" = 1'-0"
 1/4" = 1'-0"
 1/2" = 1'-0"
 3/4" = 1'-0"
 1" = 1'-0"

COLE FRANCIS
 HOLOMANVILLE FLA
 CUSTOM

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REVISION SET #1
 DATE: 3/10/2020
 REVISION SET #2
 DATE: 3/11/2020
 REVISION SET #3
 DATE: 3/20/2020
 REVISION SET #4
 DATE: 3/20/2020

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